IMPROVED SAW BLADE GUIDE AND COMPONENTS THEREFOR

BACKGROUND OF THE INVENTION

This invention relates generally to saw blade guides and blocks or inserts used on such guides to stabilize a circular saw blade or a band saw blade of a sawmill. More specifically, this invention relates to a saw blade guide that incorporates a rotational device for orienting said saw blade guide to an optimum position and providing microscopic adjustment of said saw blade guide on a saw blade and the inserts for the saw blade guide.

Generally, saw blade guides have long been known and used for stabilizing both circular saw blades and band saw blades. While some early saw blade guides, such as those disclosed in U.S. Pat. No. 435,105 to R. McChesney issued on April 8, 1890, use inserts or blocks which are removably fastened to the saw blade guide by means of threaded fasteners, none of those prior art inserts use cap screws for holding the inserts in place which are countersunk or counterbored within the insert or guide block which are threadably inserted onto and removed from a blade opposing surface of the insert and guide surface and remove from a blade opposing surface of the insert and guide surface upon which the insert is mounted.

Moreover, none of the prior art inserts that are mounted on the blade guides are constructed of a bimetal consisting of carbon steel on one surface and an austenitic chromium carbide abrasion resistant alloy on the opposing surface of the insert.

Further, none of the prior art saw guides and inserts incorporate a system for rotating a rectangular insert on a cylindrical head which incorporates a threaded rod. The

cylindrical head and threaded rod allows for microscopic adjustment of the saw guide and orientation of the rectangular guide and insert for optimum stabilization, and a securing nut for holding the guide in its optimum position.

SUMMARY OF THE INVENTION

It is the object of my invention to provide a novel metal insert for a saw blade guide of a sawmill.

It is a further object of my invention to provide a novel metal insert for a saw blade guide that is removably attached to the saw guide.

It is a further object of my invention to provide a novel metal insert for a saw blade guide, which is constructed of a bimetal. The bimetal insert is formed such that the metallic material on the portion of the insert that comes into contact with the saw blade is harder than the metallic material near the opposing surface thereof. The bimetal according to a preferred embodiment comprises an austenitic chromium carbide abrasion resistant alloy on the surface that comes into contact with the saw blade and carbon steel on the opposing side of the insert.

It is a further object of my invention to provide a novel device for rotating a rectangular guide with an insert attached on a cylindrical head and incorporating a threaded rod for the purpose of microscopic adjustment and optimum orientation of the guide and insert to the saw blade, and providing a securing nut on said threaded rod for holding the guide in position.

Briefly, in accordance with my invention there is provided a metal insert for a saw blade guide for stabilizing a saw blade. The material selected for the insert is from the

group consisting of a bimetal with one side carbon steel and the opposite side an austenitic chromium carbide abrasion resistant alloy that has a Brinell hardness number between about 460 to 614.

Further, in accordance with my invention, there is provided a saw blade guide for mounting a blade-stabilizing insert thereon. The guide consists of a base plate and an insert disposed on one surface of the base plate. The block and the insert define an interiorily drilled and counterbored blind hole that contains the cylindrical end of the threaded rod. Said insert is attached to the guide block by means of screws passing through drilled and countersunk holes in the guide block and into tapped holes in the insert. A securing nut engaging the outer surface of the threaded shaft is also provided. The securing nut is rotatable with respect to the threaded shaft such that a surface of the securing nut engages the top surface of said base plate upon rotation into engagement therewith thereby rendering the threaded shaft nonrotatable in relation to the base plate.

These and other objects, features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description and attached drawings upon which, by way of example, only the preferred emodiments of my invention are illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of a guide for stabilizing a saw blade according to a preferred embodiment of the present invention.

FIG. 2 shows an exploded perspective view of a pair of opposing guides for stabilizing a saw blade, illustrating a preferred embodiment of the present invention.

FIG. 3 shows a front elevation view of a cylindrical rotational device and incorporated threaded rod being a component of the preferred embodiment of a guide for stabilizing a saw blade shown in **FIG. 1**.

FIG. 4 shows a top plan view of a rectangular base plate being a component of the preferred embodiment of a guide for stabilizing a saw blade shown in **FIG. 1**.

FIG. 5 shows a perspective view of a novel saw guide insert being a component of **FIG. 1**.

FIG. 6 shows a side elevation view of a novel saw guide insert being a component of **FIG. 1**.

FIG. 7 shows a top plan view of a jam nut being a component of the guide shown in **FIG. 1**.

FIG. 8 shows an exploded perspective view of a guide for stabilizing a saw blade according to an alternative embodiment of the present invention.

FIG. 9 shows a top plan view of a guide insert being a component of the guide shown in **FIG. 8**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and, in particular, to **FIG. 1** and **FIG. 2**, there is shown in a preferred embodiment of my invention, an improved blade guide **10**, for use in a conventional band saw mill assembly (not shown) to stabilize a band saw blade **11** having cutting teeth **12**. The use of two improved blade guides **10a, 10b** on opposing surfaces of the blade **11**, as shown in **FIG. 2**, limits or effectively prevent lateral vibration, bending or dishing of the blade during sawing operations. A third blade guide

(not shown) may be further positioned along the smooth edge of the blade to prevent longitudinal vibration or displacement of the blade. At the outset, it will be understood that the assemblies **10a**, **10b** can also be used to stabilize a circular saw blade of a circular saw mill if so desired.

Each blade guide **10** includes a guide block **13**, which according to the embodiment shown in **FIGS. 1-7**, includes a base plate **14** having a top surface and a bottom surface and an insert **24**. The base plate **14** and insert **24** are preferably rectangular in shape as shown in the drawings, however, other polygonal shapes and configurations are also contemplated. An opening **15** disposed in the center region of the base plate **14** is configured to rotatably receive a threaded shaft **16** therein. The shaft **16** has an enlarged head section **17** at a first end thereof, a male-threaded section **18** along at least a portion of the length thereof, and a hexagonal head **19** at a second end thereof.

The opening **15** in the base plate is of a diameter larger than the outer diameter of the threaded section **18** of the shaft **16**, but smaller in diameter than the diameter of the enlarged head section **17**. Therefore, in assembling the blade guide, the length of the shaft is passed through the opening **15** until the enlarged head section **17** comes into contact with a bottom surface of the base plate **14**, such that the shaft **16** can rotate freely in relation to the base plate **14**.

The base plate **14** also includes one or more untapped screw holes **20** therein for receiving a corresponding one or more fasteners **22**. According to the shown preferred embodiment, two holes **20** are formed in the base plate **14**, one on either side of the larger central opening **15**. Each screw hole **20** may have a recessed frustroconical countersunk or counterbored portion **21** formed above the screw hole **20** so that a cap screw, such as is

shown at **22** in **FIG. 1** and **FIG. 2**, can be inserted therein to a level below the upper surface of the base plate **14**. Preferably the cap screws **22**, as shown in the example of **FIG. 1** and **FIG. 2**, is of the hex socket type for use of a standard hex wrench to secure and loosen the base plate **14** from a corresponding blade guide insert **24**, although other types of commonly known cap screws and fasteners could be employed wherein a standard tool such as a screwdriver could be used to secure and remove the blade guide insert from the base plate.

The threaded shaft **16** is threadably received in a threaded opening disposed in a mounting bracket of the saw mill assembly. The position of the guide block **13** relative to the blade **11** can be adjusted by rotation of the shaft **16** in relation to the mounting bracket thereby effecting linear translational movement of the shaft **16** along its longitudinal axis. Rotation of the shaft **16** relative to the mounting bracket can be effectuated by engaging the hexagonal head **19** with an appropriately sized and shaped tightening tool such as a wrench. The hexagonal configuration of the second end of the shaft **16** is merely one common example of a head configuration that permits the use of ordinary hand tools to impart rotation to the shaft. It is understood and contemplated that the head on the second end of the shaft may have different geometric configurations depending upon the tool that the user desires to employ. By way of example only, and not to limit the possible structures contemplated, the head **19** could be square to accommodate certain wrenches, slotted to accommodate a screwdriver, or a hex socket type for use of a standard hex wrench to secure.

The blade guide insert **24** comprises a metallic block of material having an upper surface **32** and a lower surface **34**, each said surface having a generally rectangular shape,

although other polygonal shapes are also contemplated. A circular recess **25** is formed in the central region of the upper surface **32** of the guide insert to rotatably receive the protruding enlarged head **17** of the shaft **16**. One or more tapped screw holes **26**, which correspond in location with said one or more untapped screw holes **20** in the base plate **14**, are also provided in the upper surface **32** of the guide insert **24**, for threadably receiving the corresponding one or more fasteners **22**. According to the shown preferred embodiment, two holes **26** are formed in the upper surface of the guide insert **24**, one on either side of the larger central recess **25**, and corresponding to the two holes **20** formed in the base plate **14**.

As best shown in **FIG. 6**, the guide insert **24** is formed of a bimetallic material such that the metal of lower region **28** is harder and more abrasion resistant than the metal of the upper region **27**. The metal used on the lower region **28** will be in direct contact with the saw blade **11** by way of lower surface **34**, and therefore should consist of a highly abrasion resistant alloy. Preferably austenitic chromium-carbide alloy having a Brinell hardness number between 460 and 614 is used as the metallic material for the lower region **28**. The upper region **27** must consist of a sufficiently soft material to allow drilling for the tapped screw holes **26** and machining of the circular recess **25** therein. Preferably, carbon steel is used as the metallic material for the upper region **27**. The bi-metallic guide insert is formed in such a way that the region near the center of the insert **24** consists of a combination of the two metals, thereby providing one unitary, solid, bimetallic block insert.

A securing nut **30** is provided to fixedly secure the base plate **14** and guide insert **24** in non-rotatable engagement with the shaft **16**. The inner surface of the securing nut

threadably engages the threaded region **18** of the shaft. By rotating the nut **30** in relation to the shaft, the nut can be translated along the longitudinal axis of the shaft **16**. When the nut is translated to the lowermost position on the shaft **16**, a lower surface of the nut **30** frictionally engages the upper surface of the base plate **14**, thereby preventing rotation of the base plate with respect to the shaft. When the nut **30** is rotated such that the lower surface thereof does not frictionally engage the upper surface of the base plate, the guide block **13** is freely rotatable in relation to the shaft **16**.

According to the preferred use and operation of the present invention, two guide assemblies **10a**, **10b** are disposed on opposing sides of the saw blade **11** to prevent lateral vibration, bending or dishing of the blade during sawing operations. The threaded shaft **16** is threadably received in a threaded opening disposed in a mounting bracket of the saw mill assembly. The position of the guide blocks **13a, 13b** relative to the blade **11** are then adjusted by engaging the hexagonal heads **19a, 19b** with an appropriate wrench to rotate the shafts **16a, 16b** in relation to the mounting brackets to move the shafts **16a, 16b** and guide blocks **13a, 13b** along the longitudinal axis of the respective shafts **16a, 16b** until the guide blocks **13a, 13b** are optimal distances from the blade surface, and extend toward the opposing blade surfaces as shown in **FIG. 2**. The nuts **30a, 30b** are disposed along the respective longitudinal axes of the shafts **16a, 16b** such that the lower surface thereof is not in engagement with the upper surface of the respective base plates **14a, 14b**, thereby permitting the base plates **14a**, **14b** and the inserts **24a**, **24b** respectively carried thereon to freely rotate about the axes of the respective shafts **16a, 16b**. This allows the guide blocks **13a**, 13**b** to be rotated such that the major longitudinal axis of each guide block aligns with the longitudinal axis of the blade **12**. Once the guide blocks **13a**, 13**b**

are properly positioned, the nuts **30a**, **30b** are rotated until the lower surfaces thereof come into frictional engagement with the respective upper surfaces of the base plates **14a**, **14b**, and then the nuts are tightened against the base plates to prevent rotation of the base plate relative to the shaft, thereby securing the guide block in the properly aligned position with regard to the blade.

A guide block **113** according to an alternative preferred embodiment is shown in **FIG. 8** and **FIG. 9**. The guide block **113** according to the alternative embodiment includes a T-slot **115** formed therein. The T-slot **115** has an open end **116** along one sidewall of the guideblock and a closed end **117** near a central portion of the block **113**. The closed end **117** may be rounded so as to accommodate the enlarged circular head **17** of the threaded shaft **16** therein. The guide is assembled by sliding the enlarged head **17** of the shaft **16** into the large opening of the T-slot with the shaft **16** extending through the smaller T-slot opening. The T-slot **115** is sized and shaped to allow rotation of the shaft **16** relative to the guide block **113**. An end plate **118** is secured over the open end of the T-slot to secure the shaft **16** therein. The end plate **118** is secured to the guide block by fasteners **119** in the same manner the base plate of the first embodiment is secured to the insert. A securing nut **30** is also provided to render the shaft nonrotatable in relation to the guide block when a surface of the nut engages the upper surface of the guide block **113**.

Although the present invention has been illustrated and described herein with respect to certain preferred embodiments, it is not intended that this patent should be limited in scope and coverage by such details other than as specifically set forth in the following claims.